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Water Supply Outlook For Arizona



SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

Cooperating with

SALT RIVER VALLEY WATER USERS ASSOCIATION
and ARIZONA WATER COMMISSION

AS OF
FEB. 1, 1980

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: THE SNOTEL PROJECT CENTRAL COMPUTER FACILITIES IN PORTLAND, OREGON. THE TERMINAL, PRINTER, COMPUTER AND TAPE DRIVES HAVE NOT COMPLETELY REPLACED THE SNOW SAMPLING TUBES SEEN IN THE FOREGROUND.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, Federal Building, 230 N. First Ave., Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno, Nevada 89505
Oregon	1220 S. W. Third Ave., Portland, Oregon 97204
Utah	4420 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U. S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Snow Surveys Branch, California Department of Water Resources, P.O. Box 388, Sacramento, California 95802 --- for British Columbia by the Ministry of the Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia V8V1X5 --- for Yukon Territory by the Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory Y1A 3V1 --- and for Alberta, Saskatchewan, and N.W.T. by the Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta T3C 1A6.



WATER SUPPLY OUTLOOK FOR ARIZONA

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

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Typical Snotel shelter house with antenna tower and temperature sensor .

ARIZONA SUMMARY
as of
FEBRUARY 1, 1980

THE ANTICIPATED SURFACE WATER SUPPLY FOR ARIZONA IS GOOD.

SNOW COVER

The snowpack is generally above average. Snowpack water is 148 percent of average on the Salt River drainage, 218% on the Verde, 148% on the upper Little Colorado, and 138% of average on the San Francisco-Gila basin.

The snowpack has been affected by rain below 8,000 feet and is in a primed condition. Densities are high and free water is draining.

PRECIPITATION

Precipitation was heavy in January and brought reporting stations up to well above average for the November-January period. Many stations reported over 10 inches of precipitation for the month in an area from Flagstaff to Heber. The White Mountain area received generally 5 to 6 inches of precipitation.

SOIL MOISTURE

Soils are wet from rain and melting snow. Soil moisture deficits have been generally satisfied, and the watersheds are primed for discharge.

STREAMFLOW AND WATER SUPPLY

Forecasts are for a good surface water supply. The expected runoff is 645,000 acre-feet for the Salt River System, or 122% of average. This includes forecasts of 141% of average in the Verde to 111% of average on the upper Salt Basin. Forecasts on the upper Little Colorado are also near 115% of average. The Gila is expected to produce about 80% of average runoff.

Streamflow in January was several hundred percent of average on the Salt River system. These watersheds received heavy precipitation in the form of rain and snow during the last week of January. Streamflow on the San Francisco-Gila drainage was below average for the month.

RESERVOIR STORAGE

All major reporting reservoirs have above average water storage. Eight central Arizona reservoirs have a combined storage of 2,827,000 acre-feet which is 175% of average for February 1. The six reservoirs of the Salt River Project have 143% of average storage. Water is being discharged from these reservoirs to make room for anticipated spring runoff. San Carlos Reservoir has 349% of average storage.

STREAMFLOW FORECASTS ABOUT FEBRUARY 1, 1980

STREAMFLOW FORECASTS		THIS YEAR		PAST RECORD	
BASIN, STREAM and/or FORECAST POINT	FORECAST		FORECAST PERIOD	THOUSAND ACRE FEET	
	Thousand Acre Feet	Percent of Average		Last Year	Average †
<u>SALT RIVER DRAINAGE</u>					
Salt near Roosevelt	335	111	Feb-May	1033.5	302.3
"	75	152	February	160.9	49.3
Tonto Creek near Roosevelt	50	229	Feb-May	184.5	42.3
"	20	147	February	52.6	13.6
Verde River above Horseshoe	260	141	Feb-May	449.8	184.0
"	60	142	February	82.7	42.2
Total Salt River Project Streams	645	122	Feb-May	1667.8	528.6
"	155	147	February	296.2	105.1
<u>GILA RIVER DRAINAGE</u>					
Gila River at Calva	74	111	Feb-May	419.6	94.8
Gila River near Gila	41	78	Feb-May	137.5	52.5
Gila River near Solomon	104	80	Feb-May	469.7	130.0
"	26	74	February	172.3	35.1
Gila River near Virden	52	78	Feb-May	172.9	66.6
Frisco River at Clifton	61	95	Feb-May	208.6	64.0
Frisco River at Glenwood	28	94	Feb-May	113.3	29.8
<u>LITTLE COLORADO RIVER DRAINAGE</u>					
Little Colo. River above Lyman Dam	13.0	117	Feb-June	51.3	11.1
Greer	8.7	115	Feb-June	17.6	7.6
<u>GRANITE CREEK DRAINAGE</u>					
Granite Creek	4.5	---	Feb-May	---	---
Willow Creek	3.0	---	Feb-May	---	---
<u>MIMBRES RIVER DRAINAGE</u>					
Mimbres River near Mimbres	0.9	22	Feb-May	---	4.1*
<u>COLORADO RIVER DRAINAGE</u>					
Virgin River near Littlefield	74		Apr-June		47.9
Lake Mary Inflow	8.6	175	Feb-May	14.2	4.9
† Based on 15-year period, 1963-77					
* Average for less than 15 years.					

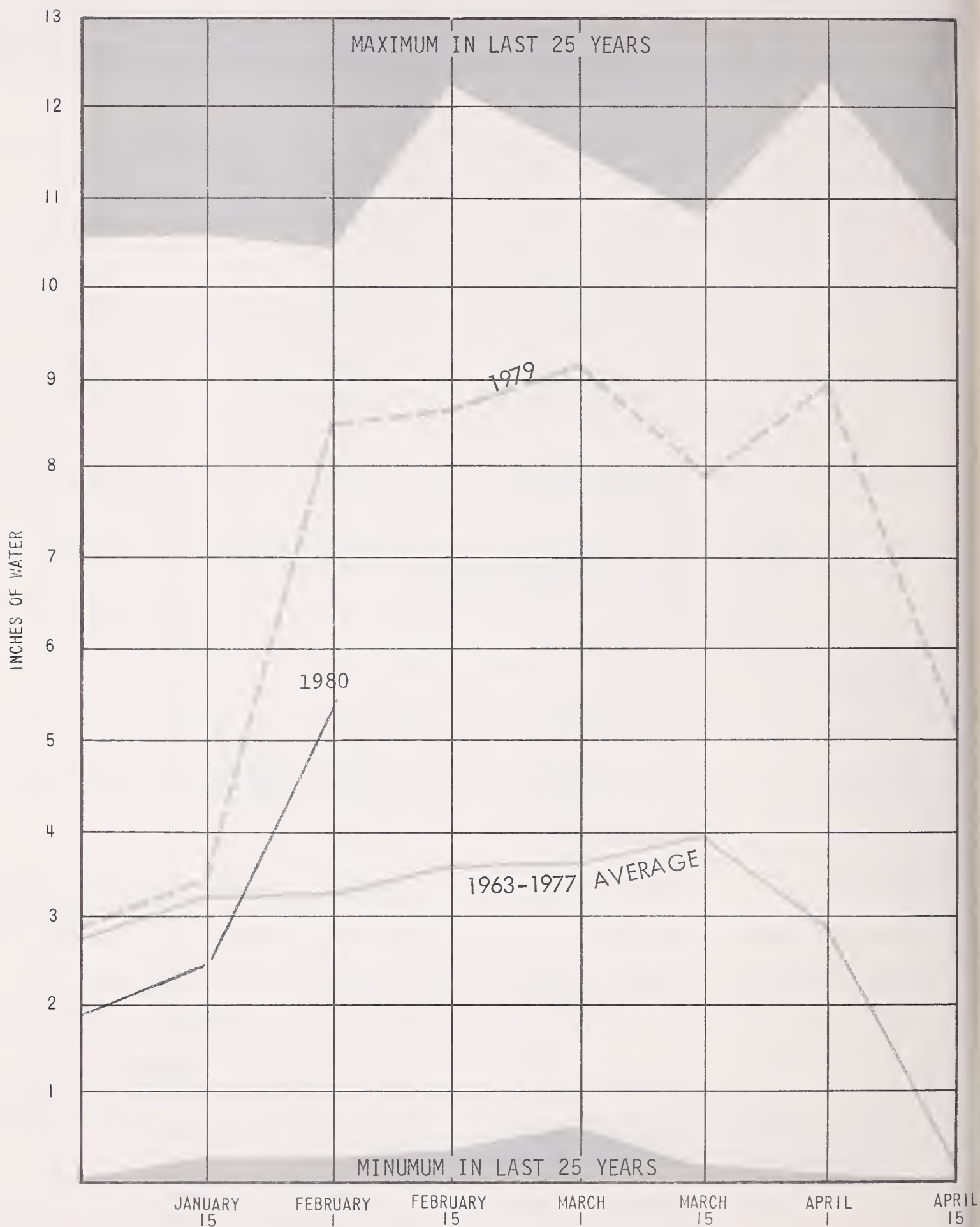
RESERVOIR STORAGE (Thousand Acre Feet) FEBRUARY 1, 1980

BASIN or STREAM	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average†
<u>GILA RIVER DRAINAGE</u>					
Agua Fria	Lake Pleasant	157.6	145.4	151.9	71.1
Granite	Watson Lake	4.7	4.6	4.6	2.5
Granite	Willow Creek	6.1	4.8	6.1	2.5*
Gila	San Carlos	1,073	813.0	819.5	232.8
Salt (4)	Roosevelt, Apache, Canyon & Saguaro	1,755	1605.3	1,461	1,185
Verde (2)	Bartlett and Horseshoe	309.6	263.3	234.3	124.5
Salt and Verde	6 Salt River Project Reservoirs	2,065	1868.6	1,695	1,310
<u>COLORADO RIVER DRAINAGE</u>					
Colorado	Lake Havasu	619.4	557.1	532.8	543.8
Colorado	Lake Mohave	1,810	1741	1,735	1,658
Colorado	Lake Mead	26,159	22,789	22,747	17,576
Colorado	Lake Powell	25,002	20,888	15,224	10,038
Little Colorado	Lyman	30.6	24.3	9.6	15.0
Little Colorado	Show Low Lake	5.1	---	5.1	1.4

† Based on 15-year average, 1963-77.

* Average is for less than 15 years of record.

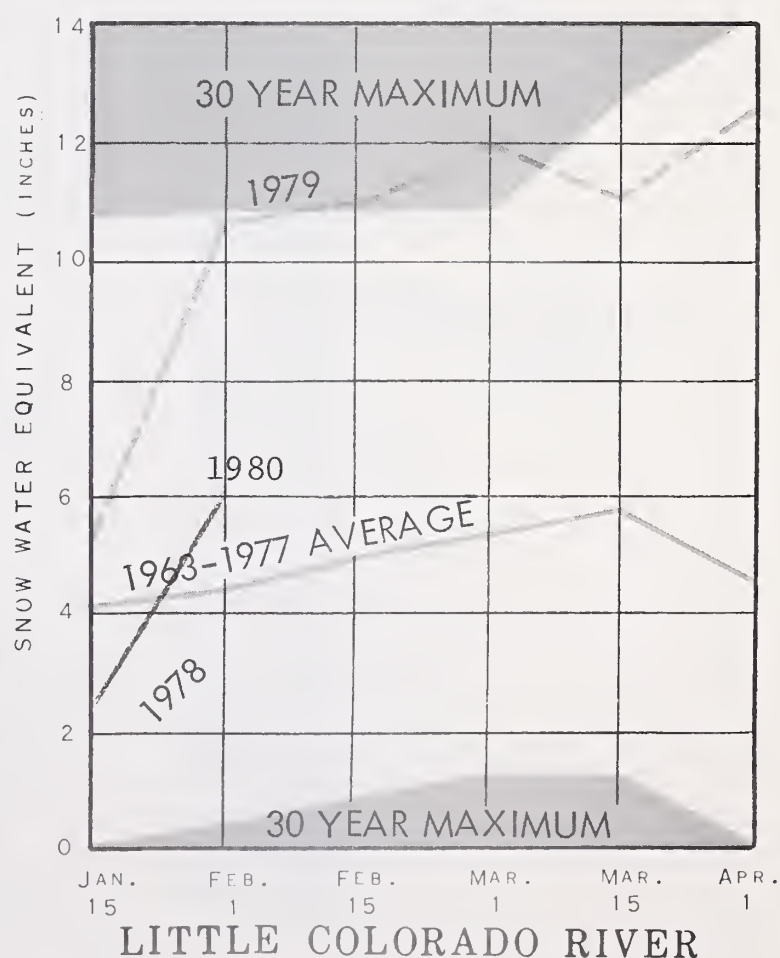
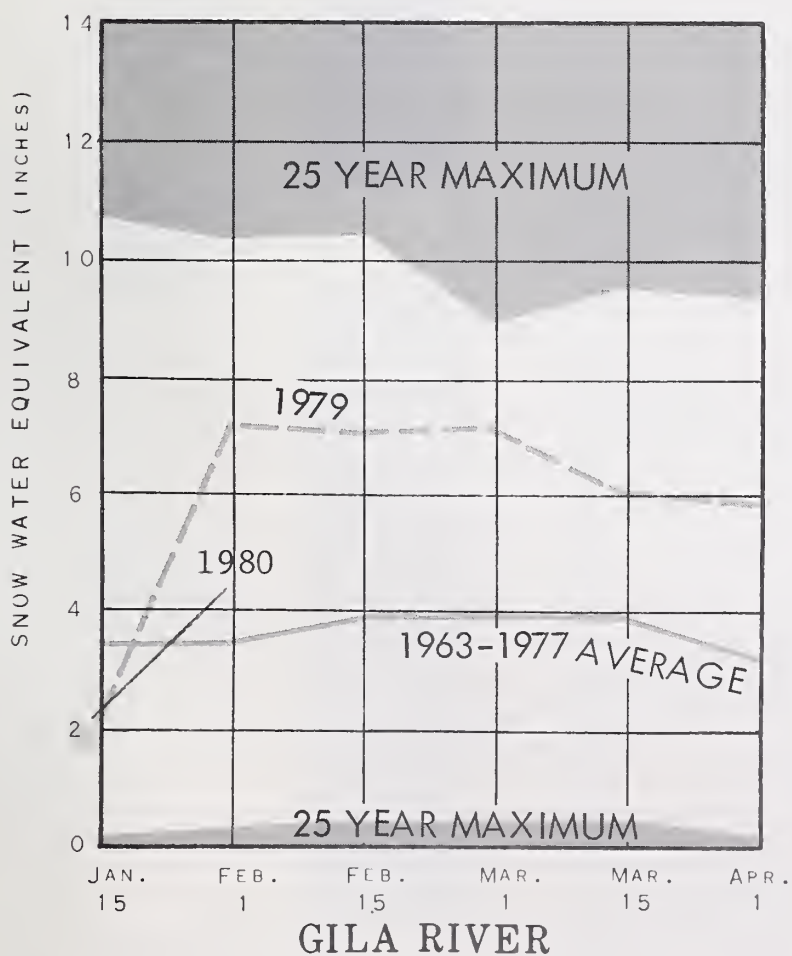
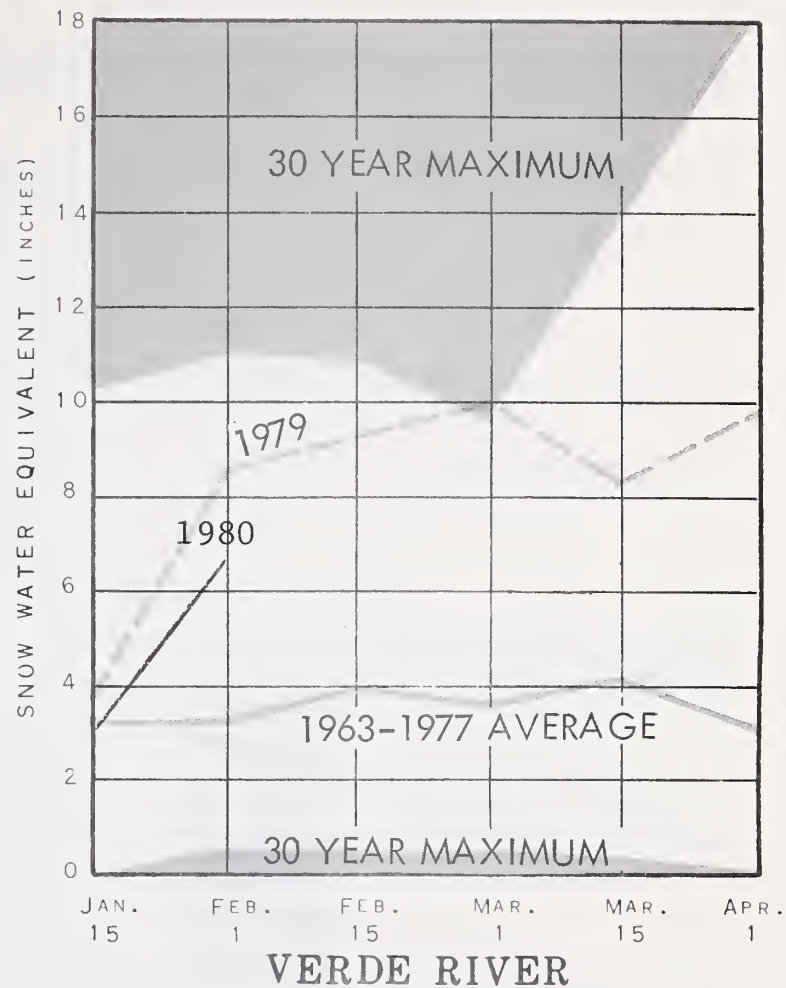
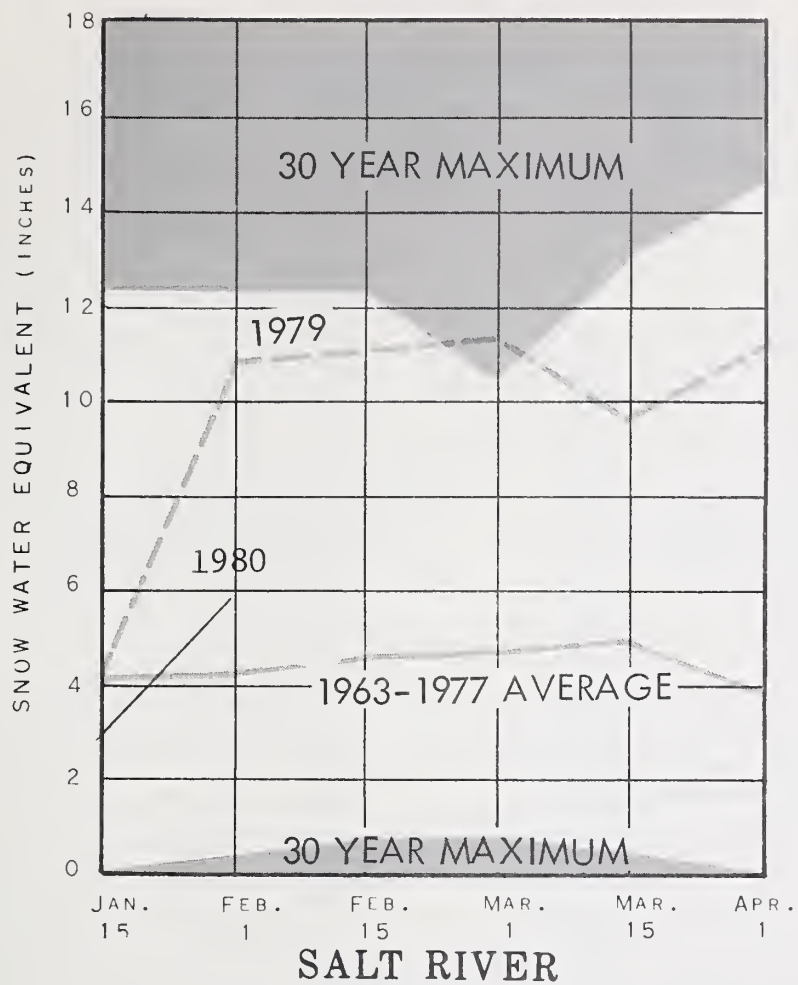
AVERAGE SNOW COVER ARIZONA 1980



This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

1980

WATERSHED SNOW COVER



BASED ON SELECTED SNOW SURVEY COURSES

ABOUT FEBRUARY 1, 1980

• 1963-1977 period.

WATER SUPPLY INVENTORY SALT RIVER VALLEY SYSTEM

IN ACRE-FEET

ANTICIPATED 1980
WATER SUPPLY

AVERAGE WATER SUPPLY
ON FEBRUARY 1

3,000,000

2,500,000

2,000,000

1,500,000

1,000,000

500,000

0

Average
Spring
Runoff

Average
Summer
Runoff

Average
Reservoir
Storage

Non-storable portion
of Forecast Runoff

Storable Portion
of Forecast Runoff

Average Summer
Runoff

Present Reservoir
Storage

Based on Present Storage + Forecast Spring Runoff + Average Summer Runoff

SNOW ABOUT FEBRUARY 1, 1980

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Elevation				Last Year	Average †
SALT RIVER						
Baldy *	9125	1/31	28	6.7	13.1	5.3
Beaver Head	8000	1/30	16	4.5	7.5	2.5
Canyon Creek	7500	1/31	19	7.1	10.0	3.5
Canyon Point	7600	1/31	23	8.3	10.1	3.8**
Coronado Trail	8000	1/31	21	5.7	5.2	2.4
Forest Dale	6430	1/31	0	0.0	2.8	1.1
Ft. Apache	9160	1/31	29	6.7	12.4	5.6
Hannagan Meadows	9090	1/30	39	9.4	15.3	6.8**
Hawley Lake	8300	1/31	35	10.7	12.1	5.7**
Heber	7600	1/31	21	7.7	9.9	3.5
Maverick Fork	9050	1/31	37	8.8	18.2	6.4
McNary	7200	1/31	19	5.6	7.6	2.2
Milk Ranch	7000	1/31	4	1.2	5.8	1.2
Mt. Ord (A)	11000	1/31	86	17.2	---	---
Nutrioso *	8500	1/30	13	3.8	5.3	1.8
Promontory Butte	7930	1/31	--	14.9E	19.0	9.5**
Smith Cienega (A)	9850	1/31	58	11.6	---	---
Sunrise Summit	10600	1/30	54	13.6	27.8	11.0**
Wilson Lake	9000	1/30	41	9.5	13.9	7.1**
Workman Creek	6900	1/31	--	4.0E	10.0	5.0
LITTLE COLORADO RIVER						
Baldy	9125	1/31	28	6.7	13.1	5.3
Canyon Creek	7500	1/31	19	7.1	10.0	3.5
Canyon Point	7600	1/31	23	8.3	10.1	3.8**
Cheese Springs	8600	1/30	22	5.3	8.1	4.7**
Forest Dale	6430	1/31	0	0.0	2.8	1.1
Ft. Apache	9160	1/31	29	6.7	12.4	5.6
Fort Valley	7350	1/31	24	5.2	5.4	1.7
Happy Jack *	7630	1/31	28	8.7	9.6	3.1
Heber	7600	1/31	21	7.7	9.9	3.5
Lake Mary	6970	1/31	11	4.1	5.4	---
McNary	7200	1/31	19	5.6	7.6	2.2
Mormon Lake	7350	1/31	25	7.9	7.6	3.7
Mormon Mountain	7500	1/31	36	11.1	10.5	4.4
Nutrioso *	8500	1/30	13	3.8	5.3	1.8
Promontory Butte	7930	1/31	--	14.9E	19.0	9.5**
Snow Bowl #1	10260	1/31	52	12.1	18.8	7.0
Snow Bowl #2	11000	1/31	73	14.1	27.4	10.9**
Wilson Lake	9000	1/30	41	9.5	13.9	7.1**

† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated.
E = Estimated.

SNOW ABOUT FEBRUARY 1, 1980

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Elevation				Last Year	Average †
<u>GILA RIVER</u>						
Bear Wallow	8100	1/31	10	4.5	10.9	3.4
Beaver Head	8000	1/30	16	4.5	7.5	2.5
Coronado Trail	8000	1/31	21	5.7	5.2	2.4
Emory Pass #1 *	7800	1/31	T	0.1	2.3	0.7**
Emory Pass #2 *	7800	1/31	1	0.4	4.0	1.5**
Frisco Divide	8000	1/31	14	4.3	4.6	2.1
Hannagan Meadows *	9090	1/30	39	9.4	15.3	6.8**
Hummingbird (A)	10550	N O	S U R V E Y		24.1	10.4**
McKnight Cabin * (A)	9300	N O	S U R V E Y		7.7	3.4**
Mogollon	7000	2/3	0	0.0	2.5	0.9
Nutrioso	8500	1/30	13	3.8	5.3	1.8
Redstone Trail	8600	2/3	19	6.8	9.0E	5.6
Rose Canyon	7300	1/31	3	0.9	7.6	2.1
Silver Creek Divide (SNOTEL)	9000	2/3	28	8.8	12.9E	8.1**
State Line	8000	1/31	16	3.2	4.9	2.4
Whitewater (A)	10750	N O	S U R V E Y		28.1	12.7**
<u>VERDE RIVER</u>						
Baker Butte	7300	1/31	24	9.4	11.1	5.1**
Baker Butte #2	7700	1/31	42	14.4	16.9	8.2**
Camp Wood	5700	N O	S U R V E Y		3.1	0.6
Chalender *	7100	1/31	22	5.8	4.4	2.3
Copper Basin Divide	6720	1/31	7	2.1	5.0	1.6
Fort Valley	7350	1/31	24	5.2	5.4	1.7
Gaddes Canyon	7600	1/31	26	8.0	6.8	3.7
Happy Jack	7630	1/31	28	8.7	9.6	3.1
Iron Springs *	6200	1/31	0	0.0	2.6	0.6
Mingus Mountain	7100	1/31	6	1.9	4.1	0.7
Mormon Lake *	7350	1/31	25	7.9	7.6	3.7
Mormon Mountain	7500	1/31	36	11.1	10.5	4.4
Newman Park	6750	1/31	23	6.3	6.5	2.0
Snow Bowl #1	10260	1/31	52	12.1	18.8	7.0
Snow Bowl #2	11000	1/31	73	14.1	27.4	10.9**
White Horse Lake Jct.	7150	N O	S U R V E Y		5.4	2.6**
White Spar	6000	1/31	2	0.3	2.2	0.5
<u>LOWER COLORADO RIVER</u>						
Bill Williams Intermediate	8550	N O	S U R V E Y		15.3	6.3**
Bill Williams Summit	8950	N O	S U R V E Y		16.9	7.5**
Chalender *	7100	1/31	22	5.8	4.4	2.3
Fort Valley	7350	1/31	24	5.2	5.4	1.7
Grand Canyon	7500	1/30	13	2.3	6.1	1.6
Williams Ski Run	7720	1/31	44	11.8	11.0	5.4**
† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated.						

SNOW ABOUT JANUARY 15, 1980

SNOW ABOUT JANUARY 15, 1980		THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Elevation				Last Year	Average †
<u>GILA RIVER</u>						
Bear Wallow	8100	1/14	4	1.2	4.1	3.2
Beaver Head	8000	1/14	8	2.4	0.9	2.8
Coronado Trail	8000	1/14	10	2.7	0.9	2.7
Emory Pass #1 *	7800	1/14	0	0.0	0.1	1.0**
Emory Pass #2 *	7800	1/14	0	0.0	0.7	1.7**
Frisco Divide	8000	1/14	10	2.5	0.7	2.4
Hannagan Meadows *	9090	1/14	21	5.6	5.8	5.8**
Hummingbird (A)	10550	---	---	---	---	9.3**
McKnight Cabin * (A)	9300	---	---	---	---	3.4**
Mogollon	7000	1/12	0	0.0	0.0E	1.4
Nutrioso	8500	1/14	4	1.3	1.0	2.1
Redstone Trail	8600	1/12	17	4.0	4.5E	5.2
Rose Canyon	7300	1/14	2	0.6	2.6	2.1
Silver Creek Divide (SNOTEL)	9000	1/12	22	5.7	6.9E	7.2**
State Line	8000	1/14	11	2.2	0.9	2.5
Whitewater (A)	10750	---	---	---	---	11.0**
<u>VERDE RIVER</u>						
Baker Butte	7300	1/14	12	4.1	4.0	4.6**
Baker Butte #2	7700	1/14	22	8.0	7.7	6.8**
Camp Wood	5700	---	---	---	0.0	0.9
Chalender *	7100	1/14	7	2.6	1.7E	2.3
Copper Basin Divide	6720	1/15	0	0.0	1.3	2.0
Fort Valley	7350	1/14	7	2.4	2.0	1.6
Gaddes Canyon	7600	1/15	11	3.4	3.2	3.6
Happy Jack	7630	1/14	13	4.1	3.3	3.0
Iron Springs *	6200	1/15	0	0.0	0.0	0.7
Mingus Mountain	7100	1/14	0	0.0	0.0	1.1
Mormon Lake *	7350	1/14	9	3.8	3.5	3.5
Mormon Mountain	7500	1/14	15	5.8	5.0	4.1
Newman Park	6750	1/14	7	2.6	1.1	2.4
Snow Bowl #1	10260	1/14	29	7.0	15.0	6.0
Snow Bowl #2	11000	1/14	47	10.7	21.4	9.2**
White Horse Lake Jct.	7150	---	---	---	2.3	2.4**
White Spar	6000	1/15	0	0.0	0.0	1.0
<u>LOWER COLORADO RIVER</u>						
Bill Williams Intermediate	8550	---	---	---	8.7	5.2**
Bill Williams Summit	8950	---	---	---	11.3	6.1**
Chalender *	7100	1/14	7	2.6	1.7E	2.3
Fort Valley	7350	1/14	7	2.4	2.0	1.6
Grand Canyon	7500	1/14	6	1.4	3.4	1.9
Williams Ski Run	7720	---	---	---	5.3	4.6**
† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated.						

SNOW ABOUT JANUARY 15, 1980

SNOW ABOUT JANUARY 15, 1980		THIS YEAR			PAST RECORD	
DRAINAGE BASIN and/or SNOW COURSE		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Elevation				Last Year	Average †
<u>SALT RIVER</u>						
Baldy *	9125	1/14	10	2.5	8.0	4.7
Beaver Head	8000	1/14	8	2.4	0.9	2.8
Canyon Creek	7500	1/14	12	4.4	3.3	3.4
Canyon Point	7600	1/14	13	4.8	3.1	3.6**
Coronado Trail	8000	1/14	10	2.7	0.9	2.7
Forest Dale	6430	1/14	0	0.0	0.6	1.8
Ft. Apache	9160	1/14	14	2.6	7.4	4.9
Hannagan Meadows	9090	1/14	21	5.6	5.8	5.8**
Hawley Lake	8300	1/14	18	4.7	4.4	4.8**
Heber	7600	1/14	11	4.8	3.2	3.5
Maverick Fork	9050	---	--	---	10.9	5.6
McNary	7200	1/14	8	3.0	1.9	2.7
Milk Ranch	7000	1/14	3	1.2	1.0	1.9
Mt. Ord (A)	11000	---	--	---	26.9	---
Nutrioso *	8500	1/14	4	1.3	1.0	2.1
Promontory Butte	7930	1/14	29	10.7	7.2	7.0**
Smith Cienega (A)	9850	---	--	---	---	---
Sunrise Summit	10600	1/15	34	8.1	17.0	9.8**
Wilson Lake	9000	1/15	26	5.1	8.3	6.1**
Workman Creek	6900	1/15	5	1.4	2.1	5.0
<u>LITTLE COLORADO RIVER</u>						
Baldy	9125	1/14	10	2.5	8.0	4.7
Canyon Creek	7500	1/14	12	4.4	3.3	3.4
Canyon Point	7600	1/14	13	4.8	3.1	3.6**
Cheese Springs	8600	1/13	14	2.8	3.5	4.2**
Forest Dale	6430	1/14	0	0.0	0.6	1.8
Ft. Apache	9160	1/14	14	2.6	7.4	4.9
Fort Valley	7350	1/14	7	2.4	2.0	1.6
Happy Jack *	7630	1/14	13	4.1	3.3	3.0
Heber	7600	1/14	11	4.8	3.2	3.5
Lake Mary	6970	1/14	T	0.1	1.5	---
McNary	7200	1/14	8	3.0	1.9	2.7
Mormon Lake	7350	1/14	9	3.8	3.5	3.5
Mormon Mountain	7500	1/14	15	5.8	5.0	4.1
Nutrioso *	8500	1/14	4	1.3	1.0	2.1
Promontory Butte	7930	1/14	29	10.7	7.2	7.0**
Snow Bowl #1	10260	1/14	29	7.0	15.0	6.0
Snow Bowl #2	11000	1/14	47	10.7	21.4	9.2**
Wilson Lake	9000	1/15	26	5.1	8.3	6.1**
† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated.						

† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated.

EARLY SEASON SURVEYS

(LATE 1979, AS COMPARED WITH LATE 1978)

<u>SNOW COURSE</u>	<u>1979</u>	<u>DEPTH</u>	<u>WATER CONTENT</u>	<u>1978</u>	<u>DEPTH</u>	<u>WATER CONTENT</u>
Baker Butte	12/12	0	0.0	12/12	8	1.8
Baldy	12/19	0	0.0	12/12	14	4.0
Bear Wallow	12/19	0	0.0	---	--	--
Beaver Head	12/18	0	0.0			
Camp Wood	12/19	0	0.0	---	--	--
Canyon Creek	12/20	0	0.0	---	--	--
Canyon Point	12/20	0	0.0	12/12	8	2.1
Chalender	12/11	0	0.0	---	--	--
Copper Basin Divide	12/18	0	0.0	---	--	--
Coronado Trail	12/19	0	0.0	---	--	--
Emory Pass No. 1	12/20	0	0.0	---	--	--
Emory Pass No. 2	12/20	0	0.0	---	--	--
Forest Dale	12/20	0	0.0	---	--	--
Ft. Valley	12/12	0	0.0	---	--	--
Frisco Divide	12/18	0	0.0	12/13	4	0.8
Gaddes Canyon	12/15	0	0.0	---	--	--
Grand Canyon	12/15	0	0.0	---	--	--
Hannagan Meadows	12/19	0	0.0	12/13	13	3.4
Happy Jack	12/12	0	0.0	---	--	--
Hawley Lake	12/20	1	0.4	---	--	--
Heber	12/20	0	0.0	12/13	9	2.0
Iron Springs	12/15	0	0.0	---	--	--
Maverick Fork	12/19	0	0.0	---	--	--
McNary	12/20	0	0.0	12/12	7	1.7
Milk Ranch	12/20	0	0.0	---	--	--
Mingus Mountain	12/15	0	0.0	---	--	--
Mogollon	12/18	0	0.0	---	--	--
Mormon Lake	12/12	0	0.0	---	--	--
Mormon Mountain	12/12	0	0.0	---	--	--
Mt. Ord	12/20	19	4.8	---	--	--
Newman Park	12/12	0	0.0	---	--	--
Nutrioso	12/19	0	0.0	---	--	--
Redstone Trail	12/18	1	1.0E	---	--	--
Rose Canyon	12/15	0	0.0	---	--	--
Silver Creek Divide	12/18	4	0.9	---	--	--
State Line	12/18	0	0.0	---	--	--
White Horse Lake Junction	12/11	0	0.0	---	--	--
White Spar	12/15	0	0.0	---	--	--
Wilson Lake	12/20	9	1.8	12/13	17	4.1
Workman Creek	12/15	0	0.0	---	--	--

E = Estimated

EARLY SEASON SURVEYS

(EARLY 1980, AS COMPARED WITH EARLY 1979)

<u>SNOW COURSE</u>	<u>1980</u>	<u>DEPTH</u>	<u>WATER CONTENT</u>	<u>1979</u>	<u>DEPTH</u>	<u>WATER CONTENT</u>
Baker Butte	1/2	7	1.9	1/4	8	2.9
Baker Butte No. 2	1/2	11	2.9	---	---	---
Baldy	1/3	11	2.2	---	---	---
Beaver Head	1/3	--	2.7E	---	---	---
Canyon Point	1/4	10	2.4	1/4	7	2.3
Chalender	1/2	7	1.6	---	---	---
Copper Basin Divide	1/3	--	0.7E	---	---	---
Coronado Trail	1/3	11	2.7	---	---	---
Emory Pass No. 1	1/3	--	0.0E	---	---	---
Forest Dale	1/3	4	1.0	---	---	---
Fort Apache	1/3	14	2.7	---	---	---
Ft. Valley	1/2	4	0.9	---	---	---
Frisco Divide	1/3	10	2.8	---	---	---
Gaddes Canyon	1/2	8	2.0	---	---	---
Hannagan Meadows	1/3	18	4.3	---	---	---
Hawley Lake	1/4	11	2.4	---	---	---
Heber	1/4	7	1.8	1/4	7	2.2
Maverick Fork	1/3	12	2.6	---	---	---
McNary	1/3	6	1.8	---	---	---
Milk Ranch	1/3	4	1.4	---	---	---
Mingus Mountain	1/2	2	0.6	---	---	---
Mormon Lake	1/3	--	1.4E	---	---	---
Mormon Mountain	1/2	6	1.4	1/4	12	4.3
Nutriosio	1/3	8	1.9	---	---	---
Promontory Butte	1/4	13	3.8	1/4	16	5.2
Silver Creek Divide	1/3	--	4.5	---	---	---
Snow Bowl #1	1/7	17	3.5	---	---	---
Snow Bowl #2	1/7	25	5.2	---	---	---
State Line	1/3	11	1.9	---	---	---
White Horse Lake Jct.	1/2	7	1.6	1/5	3	1.1
Wilson Lake	1/3	20	4.1	---	---	---
Workman Creek	1/2	--	0.5E	---	---	---

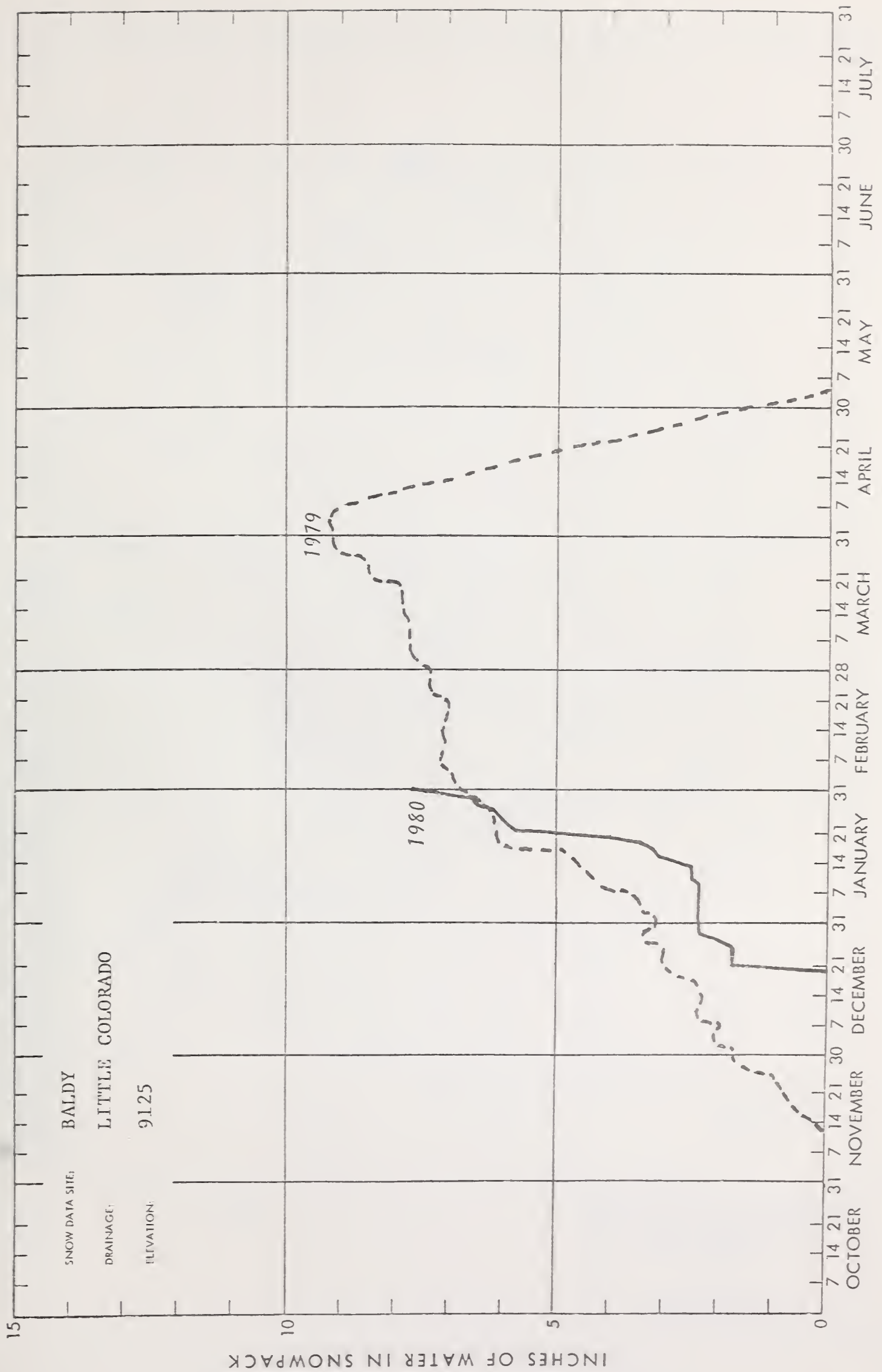
E = Estimated

SOIL MOISTURE ABOUT FEBRUARY 1, 1980

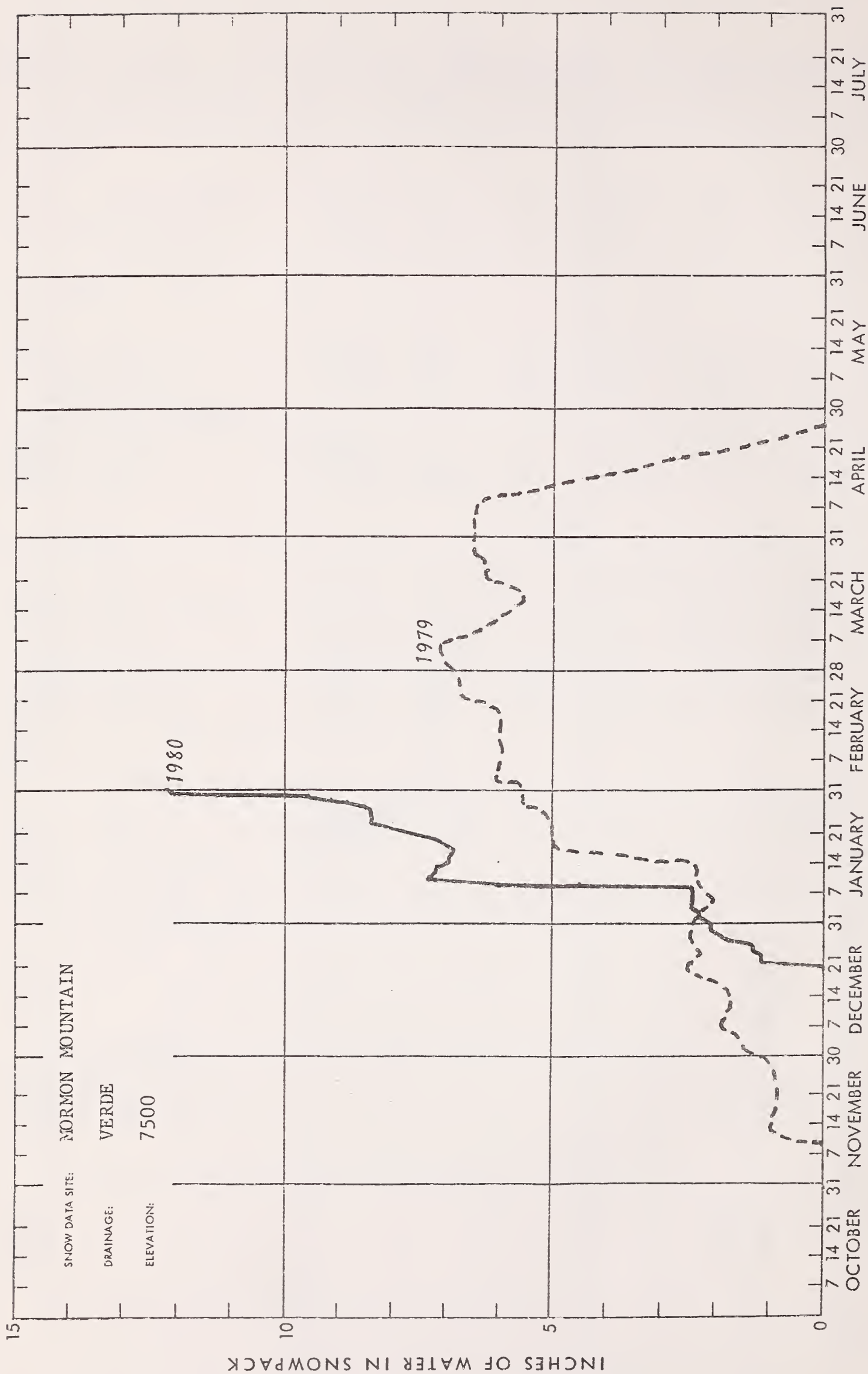
DRAINAGE BASIN and/or STATION		Profile (Inches)		Date of Survey	Soil Moisture (Inches)		
Name	Elevation	Depth	Capacity		This Year	Last Year	Average †
<u>GILA RIVER</u>							
Frisco Divide	8000	48	13.3	--	--	13.8	9.0
<u>SALT RIVER</u>							
Black River Divide	9100	48	16.8	--	--	17.4	16.7
Canyon Creek	7500	48	18.3	--	--	18.5	16.4
Corduroy Creek	6000	36	13.5	--	--	14.0	9.6
McNary	7200	48	16.3	--	--	17.7	15.4
<u>VERDE RIVER</u>							
Mormon Mountain	7500	48	16.1	1/31	17.8	17.6	15.6
Newman Park	6750	48	17.7	1/31	16.6	19.6	16.0
1963-77 15-year average.							

PRECIPITATION (Inches) ABOUT FEBRUARY 1, 1980

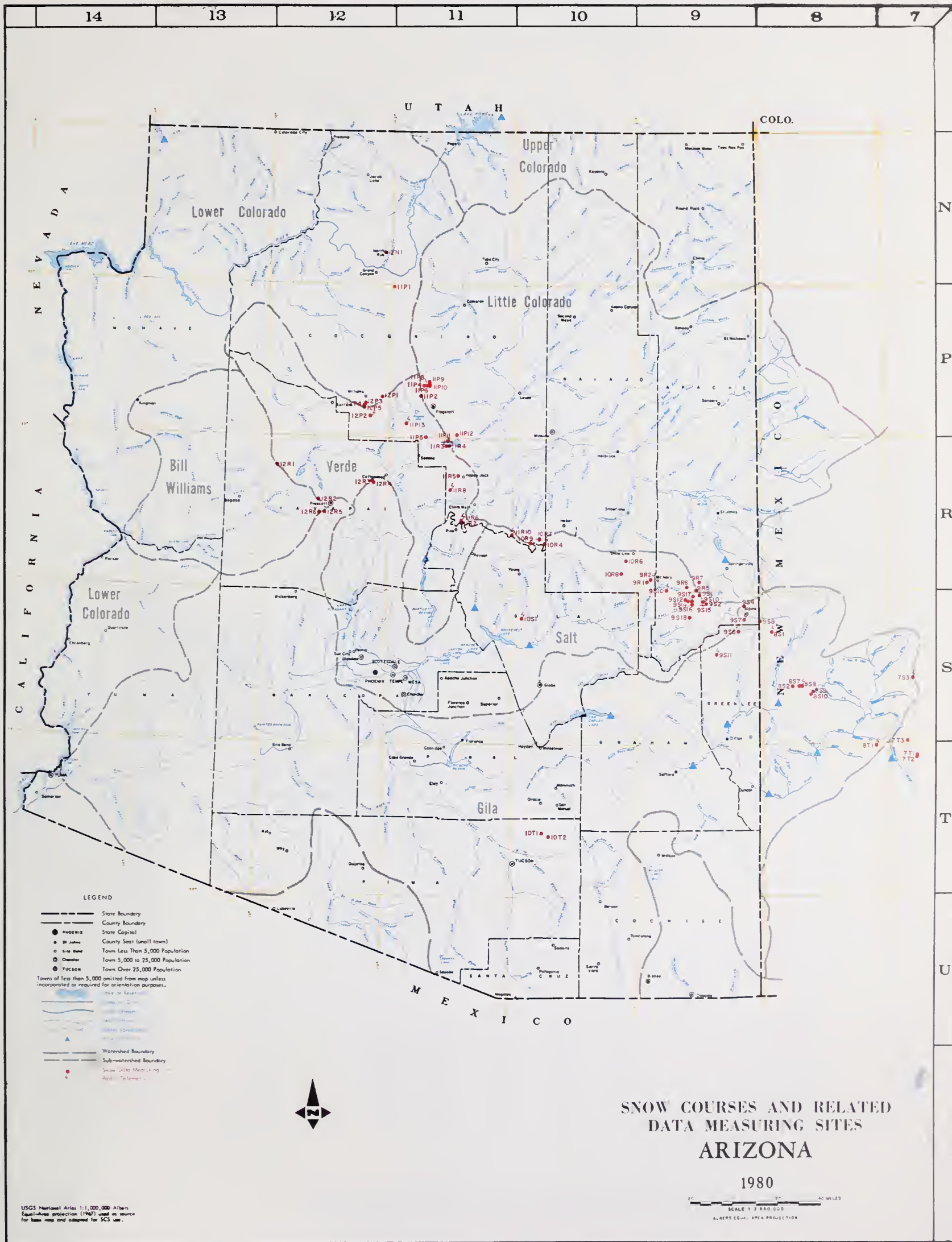
DRAINAGE BASIN and PRECIPITATION GAGE LOCATION	ELEVATION	CURRENT INFORMATION			FROM APPROX. NOV 1 TO DATE		
		Date of Reading	Month's Precipitation	Average †	This Year	Average †	Percent of Average
<u>GILA RIVER</u>							
Silver Creek Divide	9000	2/3	4.75	2.07*	8.50	8.26*	103
Hannagan Meadows **	9030	1/30	6.65	2.30	11.93	7.36	162
Frisco Divide **	8000	1/31	3.35	1.02	7.21	3.32	217
<u>SALT RIVER</u>							
Canyon Point	7600	1/31	11.54	2.96*	16.18	10.13	160
Hannagan Meadows **	9030	1/30	6.65	2.30	11.93	7.36	162
Little Wildcat (Heber Snow Course)	7600	1/31	10.02	2.65	13.98	9.02	155
Maverick Fork	9050	1/31	6.00	2.39	10.39	7.72	135
Workman Creek **	6970	---	---	3.30	---	10.18	---
Wilson Lake	9100	1/30	5.53	1.98*	9.97	7.00*	142
<u>VERDE RIVER</u>							
Baker Butte	7300	1/31	12.01	2.70*	15.72	9.52	165
Copper Basin Divide	6720	1/31	10.97	1.75	12.57	6.80	185
Fort Valley **	7350	1/31	5.86	1.44	8.54	5.22	164
Happy Jack **	7480	1/31	8.55	2.23	10.67	7.12	150
Mingus Mountain	7660	1/31	8.00	1.45	9.96	5.12	194
Mormon Mountain	7500	1/31	12.80	2.89	16.73	10.44	160
White Horse Lake Jct.**	7150	---	---	2.40	---	7.30	---
<u>LITTLE COLORADO</u>							
Greer Lakes	8500	---	---	.95	---	3.93	---
Little Wildcat (Heber Snow Course)	7600	1/31	10.02	2.65	13.98	9.02	155
Sheep Crossing (Baldy Snow Course)	9125	1/31	5.27	2.02	9.33	6.93	135
† 1963-77 Average * Adjusted Average ** Data Supplied by U.S. Forest Service							



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INDEX to SNOW COURSES and SOIL MOISTURE STATIONS

NUMBER	NAME	SEC.	TWP.	RGE.	ELEV.	DRAINAGE	OBSERVER	RECORD BEGAN
11P10A	Agassiz	32	23N	7E	11200	Little Colorado	SCS-CF*	1968
11R7	Baker Butte #2	9	12N	9E	7700	Verde	SCS	1971
11R6PSPRT	Baker Butte	4	12N	9E	7300	Verde	SCS	1966
9S1APSPRT	Baldy	28	7N	27E	9125	Little Colorado	SCS	1950
9S15	Baldy #2	12	6N	26E	9750	Little Colorado	SCS	1963
9S16	Baldy #3	13	6N	26E	10950	Little Colorado	SCS	1963
10T1	Bear Wallow	6	12S	16E	8100	Gila	FS	1948
9S6	Beaver Head	13	4N	30E	8000	San Francisco	FS	1938
12P5	Bill William Intermediate	17	21N	2E	8550	Cataract	FS	1967
12P4	Bill Williams Summit	17	21N	2E	8950	Verde	FS	1967
9S10m	Black River Divide	10	6N	27E	9400	Salt	SCS	1954
9S18PSPRT	Bonito Rock		5N	26E	8270	Salt	SCS	1979
12N1	Bright Angel	34	33N	3E	8400	Bright Angel Creek	NPS	1947
12R1	Camp Wood	3	16N	6W	5700	Verde	FS	1946
10R7M	Canyon Creek #2	18	11N	15E	7500	Little Colorado	SCS	1958
10R9P	Canyon Point	28	11N	14E	7600	Salt	SCS	1967
12P1M	Chalender	27	22N	3E	7100	Verde	FS	1947
9R7	Cheese Springs	28	8N	27E	8600	Little Colorado	SCS	1969
12R6P	Copper Basin Divide	23	13N	3W	6720	Verde	SCS	1963
10R8m	Corduroy Creek	4	8N	21E	6000	Salt	SCS	1954
9S7PSPRT	Coronado Trail	26	5N	30E	8000	San Francisco	FS	1938
7T1	Emory Pass #1	16	16S	9W**	7800	Mimbres	SCS	1967
7T2	Emory Pass #2	16	16S	9W**	7800	Mimbres	SCS	1967
11P13PSPRT	Fry	35	20N	5E	7220	Verde	SCS	1978
10R6	Forest Dale	2	9N	21E	6430	Salt	BIA	1939
9R5	Ft. Apache	18	7N	27E	9160	Little Colorado	SCS	1951
11P2P	Ft. Valley	22	22N	6E	7350	Little Colorado	FS	1947
8S1MPSPRT	Frisco Divide	31	6S	20W**	8000	San Francisco	FS	1938
12R4	Gaddes Canyon	11	15N	2E	7600	Verde	SCS	1954
11P1	Grand Canyon	21	30N	4E	7500	Hance Creek	NPS	1947
9S11PSPRT	Hannagan Meadows	19	3N	29E	9090	San Francisco	FS	1964
11R5P	Happy Jack	30	16N	9E	7630	Verde	FS	1951
9R10PSPRT	Hawley Lake	13	7N	24E	8300	Salt	BIA	1966
10R4PSPRT	Heber	28	11N	15E	7600	Little Colorado	SCS	1950
8S9A	Hummingbird	19	11S	17W**	10550	Gila	SCS	1964
11P9P	Inner Basin #1	28	23N	7E	10000	Little Colorado	SCS-CF*	1967
11P8P	Inner Basin #2	28	23N	7E	9750	Little Colorado	SCS	1967
12R2	Iron Springs	22	14N	3W	6200	Little Colorado	SCS	1946
11P12	Lake Mary	21	19N	9E	6930	Little Colorado	SCS	1975
7S3PSPRT	Lookout Mountain	1	10S	10W	8500	Gila	SCS	1978
9S2APSPRT	Maverick Fork	13	6N	27E	9150	Salt	SCS	1950
7S3A	McKnight Cabin	10	15S	10W**	9300	Mimbres	SCS	1967
9R2MPSPRT	McNary	23	8N	23E	7200	Salt	BIA	1939
9R1	Milk Ranch	33	8N	23E	7000	Salt	BIA	1941
12R3	Mingus Mountain	3	15N	2E	7100	Verde	SCS	1947
8S2	Mogollon	2	11S	19W**	7000	San Francisco	SCS	1953
11R4	Mormon Lake	13	18N	8E	7350	Little Colorado	SCS	1947
11R3MAPSPRT	Mormon Mountain	14	18N	8E	7500	Verde	SCS	1950
11R11	Mormon Mountain Summit	2	18N	8E	8470	Little Colorado	SCS	1975
9S12A	Mt. Ord	4	6N	26E	11200	Salt	SRP-SCS	1966
11P5M	Newman Park	25	19N	6E	6750	Verde	SCS	1963
9S4	Nutrioso	23	6N	30E	8500	San Francisco	FS	1938
11R10PSPRT	Promontory Butte	5	11N	13E	7930	Little Colorado	SCS	1973
8S7	Redstone Trail	5	11S	18W**	8600	San Francisco	SCS	1961
10T2	Rose Canyon	15	12S	16E	7300	Gila	FS	1948
8T1PSPRT	Signal Peak	13	16S	13W	8360	Gila	SCS	1977
8S8PSPRT	Silver Creek Divide	4	11S	18W**	9000	San Francisco	SCS	1964
9S14A	Smith Cienega	10	6N	26E	10050	Salt	SRP-SCS	1966
11P4	Snow Bowl #1	36	23N	6E	10260	Verde	FS	1961
11P6	Snow Bowl #2	31	23N	7E	11000	Verde	FS	1965
9S8	State Line	6	6S	21W**	8000	San Francisco	FS	1938
9S17	Sunrise Summit	36	7N	26E	10600	Salt	SCS	1972
11R8PSPRT	Sugarloaf	8	8E	14N	6120	Verde	SCS	1978
12P2PSPRT	White Horse Lake Jct.	2	20N	2E	7180	Verde	FS	1967
12R5	White Spar	19	13N	2W	6000	Verde	SCS	1963
8S10A	Whitewater	19	11S	17W**	10750	Gila	SCS	1964
12P3	Williams Ski Run	9	21N	2E	7720	Cataract	FS	1967
9R6P	Wilson Lake	4	7N	26E	9000	Salt	SCS	1966
10S1PSPRT	Workman Creek	33	6N	14E	6900	Salt	FS	1952

A Aerial Snow Depth Marker
M Soil Moisture Station
m Soil Moisture Station Only
P Precipitation Storage Gage
R Radio Telemetry (SNOTEL)

SP Snow Pressure Pillow
T Temperature
** NM Principal Meridian
* City of Flagstaff

The Following Organizations Cooperate in the Arizona Snow Survey Work

FEDERAL

- Department of Agriculture
 - Soil Conservation Service
 - Forest Service
 - Apache-Sitgreaves Forest
 - Coconino Forest
 - Coronado Forest
 - Gila Forest
 - Kaibab Forest
 - Prescott Forest
 - Rocky Mountain Forest and Range Experiment Station
 - Tonto Forest
- Department of Commerce
 - NOAA, National Weather Service
- Department of Interior
 - Bureau of Reclamation
 - Region III
 - Geological Survey
 - Arizona District
 - New Mexico District
 - Bureau of Indian Affairs
 - Fort Apache Reservation
 - San Carlos Irrigation Project
 - National Park Service
 - Grand Canyon National Park
- Gila Water Commissioner
 - Safford, Arizona

STATE

- Arizona Game and Fish Department
- Arizona State Parks Board
- Arizona Water Commission
- University of Arizona
 - Arizona Agricultural Experiment Station
 - Water Resource Research Center
 - Department of Watershed Management

MUNICIPAL

- City of Flagstaff

IRRIGATION PROJECTS

- Salt River Valley Water User's Association
 - Phoenix, Arizona
- San Carlos Irrigation and Drainage District
 - Coolidge, Arizona
- Maricopa County Municipal Water Conservation District

PRIVATE

- Southwest Forest Industries, Inc.
 - McNary, Arizona
- Fort Apache Indian Reservation
 - White Mountain Recreation Enterprises

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
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with the Snow Survey"*